

## GUEST EDITORS' INTRODUCTION

### SPECIAL ISSUE “PRACTICAL APPLICATIONS OF MOBILE AND INTERNET EDUCATIONAL GAMES”

Commercial games, especially Massively Multiplayer Online Role Playing Games (MMORPGs) such as World of Warcraft and EverQuest are very popular nowadays. These types of games not only have fantasy interfaces and rich storylines, but they also give the players a lot of power to control what they want to do in the game world. This freedom of choice allows players to do what they want when they want, aligning well with the constructivist paradigm of learning. This opens up a host of possibilities for using these game approaches in education to potentially improve learner's learning experience and performance.

Educational theories suggest that learners demonstrate better learning performance when they are able to control the pace and direction of their learning. Freedom of choice is also an important factor in improving the engagement and motivation of learners in self-learning, on the job training, and life-long learning scenarios. Furthermore, MMORPGs have been found to be popular in a wide age range of players. For example, in Asia, players range in age between 13 and 28 years, while in North America, players are often much older. This broad age range provides a large potential market for educational games, particularly in post-secondary and adult education. Moreover, the hierarchical level system and parallel quest lines which are common in game design have significant potential to facilitate learning based on different educational theories.

Besides Internet-based games, mobile devices have also become quite popular among game players in recent years, providing them with additional functionalities such as surfing the Internet, taking photos, making video recordings, playing audio files and sharing SMS/MMS with friends. Most mobile devices can now deliver interactive multimedia contents and even rendering 3D objects. Mobile games also enable users to play at anytime and anywhere.

This special issue focuses on sharing experiences and innovations in theoretical and conceptual issues related to the development of practical mobile and internet-based educational games. The aim is to provide readers with evidences and experiments that account for learners' experiences and perceptions related to knowledge and concepts acquisition through game approaches in various disciplines and domains.

First this special issue starts with Lee and his colleagues' research survey article on the usage and the influencing factors of using game-based learning in class. They summarize the behavior influence factors proposed in the literature results and categorize the factors into five directions like knowledge, motive, relevant training, incentive policy and resource. At the end, they find many interesting phenomena. For instance, they find

the usage of game-based learning was unaffected by gender, educational background, teaching seniority and weekly hours online for teaching purposes; on the other hand, they find the factors of relevant training, available resources and incentive policies made a bigger difference to the use of game-based learning by males than by females. More findings can be seen in this paper.

Two followed educational game design oriented papers are brought to the readers of this special issue. Chou and his colleagues propose two evenly matched competitive strategies to dynamically adapt the difficulty of game-based learning. They realize an even opportunity tactic to manipulate perceived performance in game-based learning. To verify the effectiveness of the strategies and the adaptations they have conducted two pilots with 56 participants. Their preliminary results show that dynamic difficulty adaptations, based on evenly matched competitive strategies, can adapt to different students and planned results through personalized dynamic adaptations during the game to realize even opportunity tactic. Tan and his colleagues argue that argumentation is an important reasoning skill for 21<sup>st</sup> century learning. They use Activity Theory (AT) to characterize the context of argumentation mediated by a role-playing board-game – MCM-Lite. They observe the gaming sessions to understand how argumentation patterns may emerge from playing the same game due to age and educational differences.

Two educational game researches are followed. Chen and his colleagues develop a digital game – My-Investment – to answer two research questions: (1) What are students' management behaviors in the financial management game? (2) What are students' behavior patterns in the financial management game? They have conducted a pilot with 29 fifth-grade students and they find 59% of students show appropriate financial management behavior in the game and most of them take conservative strategy. Kuo and her colleagues develop a situated Flash game which is capable of generating personalized and non-repeated daily living activities for individual children. They have conducted a small pilot to verify the effectiveness of the game and to gather users' (include parents and the autistic children) perceptions toward the game via questionnaire and interviews. They find the effectiveness of the game is positive and children's computer anxiety has negative relationships with children's digital literacy and computer coping strategies. They also make suggestions on the educational game design and on the children engagement according to their research results.

The last article of this special issue is Zhang and her colleagues' mobile educational game. They develop a moral educational game based on mobile terminal for primary schools. They also clearly explain the game design from three aspects – instructional design, scene design and script design. They have done a testing with 20 students and collected the feedback after the students played the game via a questionnaire. They find the tasks may be the best place to put teaching materials in the game compared to dialogues and world items.

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Guest Editors